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and the female of that diminutive species in the act of feeding it. The tiny excavation could scarcely afford room for its feet, to say nothing of the body, and, with feathers fluffed so as to apparently double its size, the mouth extended to its utmost, while the midget foster-mother, at the hazard of being swallowed bodily, plunging her morsels far down the abysmal throat of the ungracious usurper, who has unavoidably destroyed the mother's own birdlings in the process of its development." (Birds of Minnesota, p. 274).

The other case observed was somewhat later in the month. In both cases there was but a single specimen of the parasite, as is usually the case, and not one of the bird's own offspring was to be found, which, I think, is also the usual thing.

In the case most critically studied the bird had left the nest and was diligently following the foster-parents, both of whom were in attendance upon it, now to the ground, now to a tree, and all the while persistently clamoring for food, which they were industriously seeking to supply. And it seemed to me there was in the eye of the usurper a look of impious maliciousness, which seemed to express a semi-consciousness of wild satisfaction in the scandalous imposition.

The observations were the more interesting to me in that from my earliest recollections of bird-habit and instinct the "chippy" was among the most wary and jealous of the slightest intrusion or interference about the nest. I have known the disturbance of even the foliage in proximity to be sufficient to result in its abandonment. A note in American Ornithology, p. 296, speaks of it in the same way, and refers to it as the most punctilious on this point, often deserting the nest even after the eggs had been deposited. I have myself known the nest to be deserted upon an apparently smaller provocation after the full complement of eggs had been laid. It has, therefore, seemed strange to me that an egg so different in size and markings should be accepted and brooded, or that after the full-grown intruder had flown it should yet be so tenderly cared for, though its vagabond nature must certainly be recognized! Is it probable

that the maternal instincts are so strong as to overcome all scruples even of the tragic sort involved in the case under consideration?

If Spizella is the frequent victim of this parasitism I should be glad to know more about it. Of all the cases where I have found the eggs of the cow-bird in the nests of other birds, I have yet to find the first case of such in the nest of the "chippy." My observations may have been too limited, and I shall hereafter be on the lookout for making them more critical, and, at the same time, more extensive.

#### LETTERS TO THE EDITOR.

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#### AN INTELLIGENT SQUIRREL.

THE new home to which I removed this summer has about it two-thirds of an acre of ground bearing several old oaks, maples and other trees. Naturally enough, it has introduced me to a number of new acquaintances in furs and feathers. Of these the most interesting by far is a gray squirrel (*Sciurus Carolinensis*), the largest specimen I remember to have met. He made his first bow to us early in September, taking his position one morning upon a red oak some twenty feet from the house, with his four feet spread widely on the main trunk, his head downward and his beautiful great brush poised above his gray back. Here he remained motionless for a time, peering into a second story window where two little children were busy at play. Directly one of the children—a five-year-old—caught sight of the curious eavesdropper, and made the usual hullabaloo over him, vigorously assisted by her younger brother. The squirrel paid little attention to their excitement, save that he changed his position a little, but continued his observations. For a while there was a mutual ad-

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miration society in session, which adjourned only on the arrival of certain older members of my family. On nearly every pleasant day for the succeeding month we caught sight of him on one tree or another in the neighborhood, sometimes bearing a nut in his mouth, but oftener darting about as if simply enjoying himself among the variegated autumn leaves.

Our respect for this fellow-tenant of our grounds was greatly increased one day, when a neighbor, hearing us speak of him, told us how it came about that we enjoyed the pleasure of the little fellow's company. In this neighbor's yard stood a large tree on whose top was a stump left by a decayed and broken limb. One day it was determined to trim up this tree with some thoroughness. The workmen brought their ladder and began. Soon there appeared upon the scene a much disturbed gray squirrel. Excitement was evident in every movement as the trimming proceeded. Finally the workmen left their work for the day. When all had become quiet, my neighbor was privileged to see a curious sight—one which I cannot remember seeing or hearing described before. It was the removal of a squirrel family to a new home. The old squirrel seized each young one by the nape of the neck, while the little one threw its tail about the parent's neck, as if to hold on. Then the old one, with its precious freight, descended the tree to a boundary fence, and, by characteristic hops and runs, arrived at a hollow tree top between my house and my barn. Two or three such journeys were observed before the whole family was domiciled in the new quarters.

Whether this burden-bearer was the male or the female, I know not. Perhaps some reader of *Science* can

tell me. Indeed, I do not know whether there are a pair of the old squirrels here or not. We have never been able to observe two together. It is plain that the old squirrel came to the conclusion that its young were unsafe in the former home. Was this an inference from observation of the falling branches? The mere presence of man could not have been the ground of the conclusion, for a group of boys had played about the tree all summer, and after the removal the squirrel's freedom from fear in the neighborhood of human beings was often remarked. Its action in this instance resembles intelligence more than mere instinct.

RAY GREENE HULING.

Cambridge, Mass.

#### ST. LOUIS LIMESTONE IN POWESHIEK COUNTY, IOWA.

The St. Louis limestone described by Hall and White, and more recently by Keyes (Geol. Ia. First Am. Rep., 1892) was formerly known to occur only as far north as the eastern border of Mahaska County. Early in 1893 Bain traced this formation completely across the county in the beds of the Des Moines and South Skunk rivers, and in the North Skunk nearly to the northwestern corner. More recently several excellent exposures of this limestone have been discovered three miles above the southern line of Poweshiek County, thus extending its northern limit about ten miles beyond that previously reported. At one place nearly fifty feet of coal-measure strata were seen to rest upon the limestone. Generally, however, it was immediately overlaid with drift. Many fossils, in a fine state of preservation, were obtained from the marl which capped the rock.

ARTHUR J. JONES.

Iowa College, Grinnell, Ia.

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